Journal of Physics: Conference Series 2017 vol.927 N1

Numerical solution of the initial boundary value problems of radio-frequency capacitive coupled discharge.

Badriev I., Zheltukhin V., Ju Chebakova V.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© Published under licence by IOP Publishing Ltd. We present the numerical method, which allow to calculation of the charged particles flow density in the areas with heavy gradients of charged particles density and changing of convection-diffusion non-steady equation coefficients for charged particles concentration finding by the solution of electrons balance initial boundary value problem.

http://dx.doi.org/10.1088/1742-6596/927/1/012008

References

[1] Kudryavtsev A A, Smirnov A S and Tsendin L D 2010 Physics of glow-discharge (Saint Petersburg: Publishing house "Lan'")

[2] Chebakova V J, Zheltukhin V S and Dubrovin V T 2016 Problem of radio-frequency discharge at atmospheric pressure in local statement Applied Mathematical Sciences 10 1013-22

[3] Zheltukhin V S, Chebakova V J, Abaidullin R N and Kadyrov R F 2015 On solving of some nonlinear problems of plasma physics Applied Mathematical Sciences 9 4351-59

[4] Badriev I B and Karchevskii M M 1989 Convergence of the iterative Uzawa method for the solution of the stationary problem of seepage theory with a limit gradient Journal of Soviet Mathematics 45 1302-9

[5] Badriev I B and Nechaeva L A 2013 Mathematical simulation of steady filtration with multivalued law PNRPU Mechanics Bulletin 37-65

[6] Badriev I B, Makarov M V and Paimushin V N 2016 Numerical Investigation of Physically Nonlinear Problem of Sandwich Plate Bending Procedia Engineering 150 1050-5

[7] Badriev I B, Garipova G Z, Makarov M V and Paymushin V N 2015 Numerical Solution of the Issue about Geometrically Nonlinear Behavior of Sandwich Plate with Transversal Soft Filler Research Journal of Applied Sciences 10 428-35

[8] Badriev I B, Makarov M V and Paimushin V N 2016 Mathematical Simulation of Nonlinear Problem of Three-point Composite Sample Bending Test Procedia Engineering 150 1056-62

[9] Badriev I B and Zadvornov O A 2003 A decomposition method for variational inequalities of the second kind with strongly inverse-monotone operators Differential Equations 39 936-44

[10] Samarskii A A and Vabishevich P N 1999 Numerical methods of solution of convection-diffusion problems (Moscow: Editorial URSS)

[11] Kulikovsky A A 1995 A More Accurate Scharfetter-Gummel Algorithm of Electron Transport for Semiconductor and Gas Discharge Simulation Journal of computational physic 119 149-55

[12] Dubrovin V T, Chebakova V Ju and Zheltukhin V S 2016 Radio-Frequency Discharge at Low Pressure: a Non-Local Problem Statement Approach Procedia Engineering 150 1041-5

[13] Askhatov R. M., Chebakova V. Yu. and Zheltukhin V. S. 2016 Capacitive coupled RF discharge: modelling at the local and not local statement of the problem IOP Conf. Ser.: Mater. Sci. Eng. 158 012009

[14] Badriev I B, Chebakova V Y and Zheltukhin V S 2017 Capacitive coupled RF discharge: Modelling at the local statement of the problem J. Phys.: Conf. Ser. 789 012004

[15] Chebakova V J, Gerasimov A V and Kirpichnikov A P 2016 On the solving of one type of problems of mathematical physics IOP Conf. Ser.: Mater. Sci. Eng. 158 012023